Stantec Analytical Validation Checklist Report No. ASX63

Project Name: Amtrak North Yard	Project Number: 213402048
Validator: Sarah Von Raesfeld	Laboratory: Eurofins/Lancaster Laboratory
Date Validated: 9/15//2018	Laboratory Project Number: 1318406
Sample Start-End Date: 6/21/2012	Laboratory Report Date: 8/9/2012

Parameters Validated:

Polychlorinated Biphenyls (PCBs) by EPA SW-846 3546/8082 – soil matrix

PCBs by EPA SW-846 3510C/8082 –water matrix

Semi-volatile Organic Compounds (SVOCs) by EPA SW-846 3546/8270C – soil matrix

SVOCs by EPA SW-846 3510C/8270C – water matrix

Volatile Organic Compounds (VOCs) by EPA SW-846 5035A/8260B - soil matrix

VOCs by EPA SW-846 5030B/8260B – water matrix

Total Petroleum Hydrocarbons (TPH) Diesel Range Organics (DRO) by EPA SW-846 3546/8015B – soil matrix

TPH DRO by EPA SW-846 3510C/8015B

TPH Gasoline Range Organics (GRO) by EPA SW-846 5035A/8015B - soil matrix

TPH GRO by EPA SW-846 5030B/8015B - water matrix

Target Analyte List (TAL) Metals by EPA SW-846 3050B/6010B - soil matrix

TAL Metals by EPA SW-846 3005A/6010B - water matrix

Mercury by EPA SW-846 7471A (soil matrix) and 7470A (water matrix)

Moisture Content by SM 2540 G

Samples Validated:

SS-2012-22, LLI # 6701845

SS-2012-22MS, LLI # 6701846

SS-2012-22MSD, LLI # 6701847

SS-2012-22DUP, LLI # 6701848

SS-2012-Dup, LLI # 6701849

SS-2012-23, LLI # 6701850

SS-2012-15, LLI # 6701851

SS-2012-19, LLI # 6701852

SS-2012-20, LLI # 6701853

SS-2012-16, LLI # 6701854

SS-2012-21, LLI # 6701855

SS-2012-25, LLI # 6701857

SS-2012-24, LLI # 6701858

SS-2012-18, LLI # 6701859

SS-2012-14, LLI # 6701860

EB-06212012, LLI # 6701861

SS-2012-40, LLI # 6701862

SS-2012-39, LLI # 6701863

SS-2012-38, LLI # 6701864

SS-2012-34, LLI # 6701865

VALIDATION CRITERIA CHECK			
Validation Flags Applicable to this Review: **U** The analyte was analyzed for, but not detected above the reported sample quantitation limit. **J** The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample. **J+** Result is estimated quantity but the result may be biased high. **J-** Result is estimated quantity but the result may be biased low. **UJ** The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample. **NJ** The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration. **B** The analyte was detected in the method, field, and/or trip blank. **R** The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.			
1. Were all the analyses requested for the samples submitted with each COC completed by the lab?		Yes **X**	No
Comments:			
2. Did the laboratory identify any non-conformances related to the analytical result?		Yes **X**	No
Comments: The laboratory narrated spike recoveries for VOCs and SVOCs, duplicate RPDs for TPH DRO, and calibration for PCBs that did not meet laboratory-established criteria.			
3. Were sample Chain-of-Custody forms complete?		Yes **X**	No
Comments:			
4. Were samples received in good condition and at the appropriate temperature?		Yes **X**	No
Comments:			
5. Were sample holding times met?		Yes **X**	No
Comments:			
6. Were correct concentration units reported?		Yes **X**	No
Comments:			
7. Were detections found in laboratory blank samples?		Yes	No **X**
Comments:			
8. Were detections found in field blank, equipment rinse blank, and/or trip blank samples?	NA	Yes	No **X**
Comments:			
9. Were instrument calibrations within method criteria?	NA **X**	Yes	No

Comments: Not Applicable, Level II data validation.			
10. Were surrogate recoveries within control limits?		Yes	No **X**
Comments: VOCs: All surrogates were within the 2014 National Functional Guidelines (NFG) for Organic Data Review acceptance criteria. SVOCs: All surrogates were within the NFG acceptance criteria PCBs: PCBs: The recovery of surrogates tetrachloro-m-xylene and decachlorobiphenyl (DCB) exceeded the NFG upper control limit in sample SS-2012-40 (244% and 527%, respectively). Detected Aroclor results were qualified as estimated with a high bias (J+). The recovery of DCB was below the NFG lower control limit in SS-2012-25 (59%). PCB-1260 was detected in the sample and was qualified as estimated with a low bias (J-). The remaining Aroclors were qualified as estimated non-detects (UJ). TPH DRO and GRO: The o-terphenyl surrogate recovery was above laboratory-established criteria for sample SP-2012-16 (138%). The NFG and the Delaware Department of Natural Resources and Environmental Control Standard Operating Procedures for Chemical Analytical Programs (SOPCAP) do not include criteria for DRO or GRO, therefore no data were qualified. Reason Code: SURR			
11. Were laboratory control sample(s) (LCS/LCSD) sample recoveries within control limits?		Yes	No **X**
Comments: The TPH DRO LCS percent recovery was less than the laboratory's lower control limit. The NFG SOPCAP do not include criteria for DRO, no data were qualified. All other LCS/LCSD recoveries met applicable acceptance criteria.			
12. Were matrix spike (MS/MSD) recoveries within control limits?	NA	Yes	No **X**
Comments: The sample SS-2012-22 was analyzed as the site-specific MS/MSD. VOCs: The MS percent recovery exceeded the NFG upper control limit for benzene, chlorobenzene, and trichloroethene (146% and 138%, respectively). All three compounds were not detected in the parent sample and were not qualified. SVOCs: All SVOC recoveries met NFG and SOPCAP acceptance criteria. PCBs: All PCB recoveries met NFG acceptance criteria TPH: TPH recoveries met all laboratory acceptance criteria; the NFG and SOPCAP do not include criteria for DRO or GRO. Metals: MS/MSD recoveries were outside of NFG acceptance criteria for chromium (235 and 143%, respectively), copper (273 and 135%, respectively), and antimony (MSD 48%). All three metals were detected in the parent sample; chromium and copper and were qualified as estimated with a high bias (J+) and antimony was qualified as estimated with a low bias (J-). Reason Code: MS			
13. Were RPDs within control limits?		Yes	No **X**

Comments: VOCs: All SVOC RPDs met NFG acceptance criteria. SVOCs: All SVOC RPDs met NFG and SOPCAP acceptance criteria. TPH: TPH RPDs met laboratory acceptance criteria; the NFG and SOPCAP do not include limits for DRO or GRO. Metals: The MS/MSD RPDs exceeded NFG acceptance criteria for chromium (21%) and copper (22%). The metals were qualified as estimated (J) in the parent sample. Reason Code: LDUP			
14. Were dilutions required on any samples?		Yes **X**	No
Comments: VOCs: Five soil samples required dilution prior to analysis, dilution factors ranged from 46X to 87X. SVOCs: Two soil samples required a 10X dilution prior to analysis. PCBs: Nine soil samples required dilution prior to analysis, dilution factors ranged from 5X to 2500X. TPH: Six soil samples required dilution prior to analysis for GRO, dilution factors ranged from 22X to 260X. Three soil samples required dilution prior to analysis for DRO, dilution factors ranged from 5X to 20X Metals: Six soil samples required a 2X dilution prior to analysis Sample reporting limits were adjusted accordingly. No data were qualified.			
15. Were Tentatively Identified Compounds (TIC) present?	NA **X**	Yes	No
Comments: TIC not requested.			
16. Were organic system performance criteria met?	NA **X**	Yes	No
Comments: Not Applicable, Level II data validation.			
17. Were GC/MS internal standards within method criteria?	NA **X**	Yes	No
Comments: Not Applicable, Level II data validation.			
18. Were inorganic system performance criteria met?	NA **X**	Yes	No
Comments:			
19. Were blind field duplicates collected? If so, discuss the precision (RPD) of the results.		Yes **X**	No
Comments: SS-2012-22 and SS-2012-Dup were collected as the field duplicate pair. Duplicate RPDs were calculated for parameters detected in both the primary and field duplicate samples. Chrysene (62%), fluoranthene (54.8%), phenanthrene (61%), and pyrene (65%) RPDs exceeded project criteria and were qualified as estimated (J) in both the parent and field duplicate samples. Reason Code: FDUP			
20. Were at least 10 percent of the hard copy results compared to the Electronic Data Deliverable Results?	Yes **X**	No	Initials KEF
Comments:			
21. Other?		Yes	No **X**

Comments:			
PRECISION, ACCURACY, METHOD COMPLIANCE AND COMPLETENESS ASSESSMENT			
Precision:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Sensitivity:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Accuracy:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Representativeness:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Method Compliance:	Acceptable X	Unacceptable	Initials SVR
Comments:			
Completeness:	Acceptable X	Unacceptable	Initials SVR
Comments:			